One may doubt, however, whether the cuts protraying the features of Prince, Rogers, and Munson flatter these leaders. As a whole, the book seems to do well what it is intended to do.—Rodney H. True.

NOTES FOR STUDENTS

Cactaceae.—It is probable that no monograph of a family is based upon more complete study than the monograph of Cactaceae by Britton and Rose,[2] the first volume of which has just appeared. The illustrations are very numerous and admirable, and the colored plates are especially noteworthy. The authors began the study in 1904, and since that time the field work extended beyond North America, which was the original limit, so as to include the arid regions of South America as well. Those who are acquainted with the Cactaceae realize that not only are herbarium and field studies necessary, but also greenhouse studies, to discover the different phases that may appear during development.

The present volume includes the tribe Pereskieae, with its single genus *Pereskia*, represented by 19 species, 4 of which are new, and also the tribe Opuntieae, in which 7 genera are recognized, one of which is new (*Tacinga*). The large genus is *Opuntia*, with 264 species, grouped into 3 subgenera and 46 series, 32 of the species being new. New species are also described in *Pterocactus* (3) and *Nopalea* (2). All of the genera are illustrated, and of the 312 species 267 are represented by one or more illustrations. Of the 36 plates, 28 are in color.

The investigation has been financed chiefly by the Carnegie Institution of Washington, in cooperation with the New York Botanical Garden and the United States National Museum, while the United States Department of Agriculture has taken care of the living collections brought together in Washington. The completed monograph will consist of four volumes.—J. M. C.

Zinc and growth of Aspergillus niger.—Steinberg[3] finds that he gets maximum growth in cultures of *Aspergillus niger* in flasks of Jena glass without additions of zinc sulphate, while less than half maximum growth is given in pyrex and Kavalier Bohemian glass flasks without zinc additions, and maximum growth with such additions (10 mg. Zn/L). Steinberg thinks this is explained by the fact that Jena glass contains considerable zinc, while the other glasses do not. This accords with analysis of Jena and Kavalier Bohemian glass, and with the experiments of other workers on the relation of zinc to the development of this organism. He has also worked with 2 strains of *A. niger*, which he terms *W* and *V*, and finds that the former demands a higher concentration

[2] Britton, N. L., and Rose, J. N., The Cactaceae. Publ. Carnegie Inst. Washington 1: pp. 236. *pls. 36. figs. 302.* 1919.

[3] Steinberg, R. A., A study of some factors influencing the stimulative action of zinc sulphate on the growth of *Aspergillus niger*. I. The effect of the presence of zinc in the cultural flasks. Mem. Torr. Bot. Club 17:287–293. 1918.

of zinc for its maximum growth than does the latter. He believes that the variation in zinc optimum found by different workers for this species can be explained in part by the difference in the strains, and in part by the difference in the composition of the cultural vessels used. He thinks that pyrex glass, if free from zinc, may bear other substances that stimulate slightly, and that gradual dissolution of these from the glass may account for the continual decrease in yield when cultures are repeated many times in the same flasks. He also admits that other unknown factors may account for this. He thinks it probable that this species has never been grown in total absence of zinc.—Wm. Crocker.

Multiple eggs in bryophytes.—Florin,[4] studying the archegonium of *Riccardia pinguis*, finds the axial row very variable. One archegonium contained an axial row of 4 cells, all of which had developed into eggs; another contained a single egg, 2 ventral canal cells, and 2 rows of neck canal cells; still another contained 4 eggs in the venter after the canal cells had completely disintegrated. Such so-called abnormalities are frequent in bryophytes, making it increasingly clear that both the antheridium and the archegonium are derived from a common gametangium, and that the archegonium occasionally reverts to that time when multiple eggs were the rule instead of the exception. Some mosses revert to a time still more distant, a time when both male and female gametes were present in the same gametangium, since we occasionally find both spermatogenous and oogenous cells in the same sex organ, which usually has the external form of an archegonium.—W. J. G. Land.

Tyrosinase of fungi.—Dodge[5] has made a very careful chemical study of the action of tyrosinase on tyrosin. He obtained his enzyme from *Daedalis confragosa*, *Armillaria mellea*, and *Polyporus sulphureus*. He finds (1) that the tyrosin molecule is not deaminized, and (2) that in the formation of the colored compounds the tyrosin molecules are combined into larger molecules, accompanied by the masking of the carboxyl groups.—J. J. Willaman.

Absorption of gold.—The ability of *Penicillium glaucum* and *Oidium lactis* to develop from conidia in colloidal gold solutions to which tannic acid or gum arabic has been added has been studied by Miss Williams.[6] The colloidal gold is slowly removed from solution during growth, removal being effected by the uncuticularized walls. The gold did not enter the protoplasm. No satisfactory explanation of the phenomena was found.—C. A. Shull.

[4] Florin, Rudolf, Das Archegonium der *Riccardia pinguis* (L) B.Gr. Svensk. Bot. Tidskr. 12:464–470. *figs. 4.* 1918.

[5] Dodge, C. W., Tyrosin in the fungi: chemistry and methods of studying the tyrosinase reaction. Ann. Mo. Bot. Gard. 6:71–92. 1919.

[6] Williams, Maud, Absorption of gold from colloidal solution by fungi. Ann. Botany 32:531–534. 1918.